

a fifth step of forming at least first and second thin film transistors, using said at least first and second semiconductor islands,

wherein a pixel matrix circuit comprises said first thin film transistor and a driver circuit comprises said second thin film transistor, and

wherein said laser beam has an irradiation area of said pulsed laser beam of 10 cm² or more. *Intended use recitation*

3. (Thrice Amended) A method of manufacturing a semiconductor device, comprising:

a first step of forming a semiconductor film on a substrate having an insulating surface;

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encl. a second step of holding a catalytic element that promotes the crystallization of said semiconductor film in contact with an entire surface of said semiconductor film;

a third step of irradiating a laser beam shaped in a rectangle or a square from one side of said semiconductor film toward another side thereof while moving said substrate to sequentially crystallize said semiconductor film to form a crystalline semiconductor film,

a fourth step of patterning said semiconductor film to form at least first and second semiconductor islands after the irradiation of the laser beam, and

a fifth step of forming at least first and second thin film transistors, using said at least first and second semiconductor islands,

wherein a pixel matrix circuit comprises said first thin film transistor and a driver circuit comprises said second thin film transistor, and

wherein said laser beam has an irradiation area of said pulsed laser beam of 10 cm² or more.

D2 4. (Twice Amended) A method of manufacturing a semiconductor device, comprising:

a first step of forming a semiconductor film over a substrate;

a second step of holding a catalytic element contained in a solution which promote the crystallization of said semiconductor film in contact with an entire surface of said semiconductor film;

a third step of irradiating a laser beam whose irradiation area in one shot is 10 cm^2 or more to said semiconductor film to crystallize said semiconductor film and to form a crystalline semiconductor film;

a fourth step of patterning said semiconductor film to form at least first and second semiconductor islands after the irradiation of the laser beam, and

a fifth step of forming at least first and second thin film transistors, using said at least first and second semiconductor islands,

wherein a pixel matrix circuit comprises said first thin film transistor and a driver circuit comprises said second thin film transistor.

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5. (Twice Amended) A method of manufacturing a semiconductor device, comprising:

a first step of forming a semiconductor film over a substrate;

a second step of holding a compound containing a catalytic element which promotes the crystallization of said semiconductor film in contact with an entire surface of said semiconductor film;

a third step of irradiating a laser beam whose irradiation in one area in one shot is 10 cm^2 or more to said semiconductor film to crystallize said semiconductor film and to form a crystalline semiconductor film;

a fourth step of patterning said semiconductor film to form at least first and second semiconductor islands after the irradiation of the laser beam, and

a fifth step of forming at least first and second thin film transistors, using said at least first and second semiconductor islands,

wherein a pixel matrix circuit comprises said first thin film transistor and a driver circuit comprises said second thin film transistor.

6. (Twice Amended) A method of manufacturing a semiconductor device, comprising:

a first step of forming a semiconductor film over a substrate;

a second step of holding a catalytic element which promotes the crystallization of said semiconductor film in contact with an entire surface of said semiconductor film;

a third step of irradiating a laser beam whose irradiation area in one shot is 10 cm^2 or more to said semiconductor film to crystallize said semiconductor film and to form a crystalline semiconductor film;

a fourth step of conducting a thermal oxide processing in an oxide atmosphere to form an oxide film on the surface of said crystalline semiconductor film and gettering said catalytic element to said oxide film to remove or reduce said catalytic element existing in said crystalline semiconductor film;

a fifth step of patterning said semiconductor film to form at least first and second semiconductor islands after the irradiation of the laser beam, and

a sixth step of forming at least first and second thin film transistors, using said at least first and second semiconductor islands,

wherein a pixel matrix circuit comprises said first thin film transistor and a driver circuit comprises said second thin film transistor.

7. (Twice Amended) A method of manufacturing a semiconductor device as claimed in claim 6, further comprising a step of removing said oxide film after said fourth step.

8. (Twice Amended) A method of manufacturing a semiconductor device, comprising:

a first step of forming a semiconductor film over a substrate;

a second step of holding a catalytic element which promotes the crystallization of said semiconductor film in contact with an entire surface of said semiconductor film;

a third step of irradiating a laser beam whose irradiation area in one shot is 10 cm^2 or more to said semiconductor film to crystallize said semiconductor film and to form a crystalline semiconductor film;

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a fourth step of selectively adding phosphorus or boron to said crystalline semiconductor film and gettering said catalytic element to said added region by conducting a heat treatment to remove or reduce said catalytic element existing in said crystalline semiconductor film;

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encl.*
a fifth step of patterning said semiconductor film to form at least first and second semiconductor islands after the irradiation of the laser beam, and

a sixth step of forming at least first and second thin film transistors, using said at least first and second semiconductor islands,

wherein a pixel matrix circuit comprises said first thin film transistor and a driver circuit comprises said second thin film transistor.

20. (Thrice Amended) A method of manufacturing a semiconductor device comprising the steps of:

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forming a semiconductor film comprising amorphous silicon on an insulating surface;

providing an entire surface of said semiconductor film with a crystallization promoting material comprising a metal,

crystallizing said semiconductor film by irradiating said semiconductor film with a pulsed laser beam,

patterning said semiconductor film to form at least first and second semiconductor islands after the irradiation of the laser beam, and

forming at least first and second thin film transistors, using said at least first and second semiconductor islands,

wherein a pixel matrix circuit comprises said first thin film transistor and a driver circuit comprises said second thin film transistor, and

wherein said laser beam has a pulse width of 200 nsec or more,

wherein said laser beam has an irradiation area of said pulsed laser beam of 10 cm² or more.

21. (Thrice Amended) A method of manufacturing a semiconductor device comprising the steps of:

forming a semiconductor film on an insulating surface;
providing an entire surface of said semiconductor film with a crystallization promoting material comprising a metal;
crystallizing said semiconductor film by irradiating said semiconductor film with a pulsed laser beam having a square shape cross section,
patterning said semiconductor film to form at least first and second semiconductor islands after the irradiation of the laser beam, and
forming at least first and second thin film transistors, using said at least first and second semiconductor islands,
wherein a pixel matrix circuit comprises said first thin film transistor and a driver circuit comprises said second thin film transistor, and
wherein said laser beam has a pulse width of 200 nsec or more, and an irradiation area of said pulsed laser beam is 10 cm² or more.

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